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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/630,632	07/29/2003	Gerd Frankowsky	12816-093001 / S-2512	9058
26161	7590	02/23/2005	EXAMINER	
FISH & RICHARDSON PC 225 FRANKLIN ST BOSTON, MA 02110			ROMAN, ANGEL	
			ART UNIT	PAPER NUMBER
			2812	

DATE MAILED: 02/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/630,632	Applicant(s) FRANKOWSKY ET AL.	
	Examiner Angel Roman	Art Unit 2812	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

**A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.**

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 15 December 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 25-52 is/are pending in the application.
- 4a) Of the above claim(s) 37-52 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 25-29 and 31-36 is/are rejected.
- 7) ☒ Claim(s) 30 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>12/08/03</u> | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election without traverse of Group II claims 25-36 in the reply filed on 12/15/04 is acknowledged.
2. It is suggested that applicants cancel non-elected claims 37-52 in response to this office action.

### ***Information Disclosure Statement***

3. The examiner has considered the reference submitted in the information disclosure statement filed 12/08/03.

### ***Oath/Declaration***

4. The Oath filed 02/27/04 is acceptable.

### ***Drawings***

5. The drawings filed 07/29/03 are acceptable.

### ***Claim Rejections - 35 USC § 112***

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

7. Claim 36 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

8. Claim 36 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: the location where the conductive layer is provided in relation to the circuit module. The omitted structural relationship is essential in order to have a clear understanding of the invention.

***Claim Rejections - 35 USC § 102***

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical

Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000.

Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

10. Claims 25 and 34 are rejected under 35 U.S.C. 102(b) as being anticipated by Kwon et al. U.S. Patent 6,235,552 B1.

Regarding claim 25, Kwon et al. discloses a method for fabricating a semiconductor circuit module comprising; providing circuit devices 102, each having a contact area 104 on a front side thereof; applying a patterned connection layer 122 to a transfer substrate 110 (see figure 22); applying the front side of the circuit devices 102 to the patterned connection layer 122 (see figure 23); applying a filler 156 between the circuit devices 102 (see figure 24); removing the transfer substrate 110 (see figure 26); and applying an electrical connection device 136 to connect the circuit devices 102 (see figure 27).

Regarding claim 34, Kwon et al. discloses curing said filler before removing said transfer substrate (see column 5, lines 40-45).

11. Claims 25-27, 29, 31 and 32 are rejected under 35 U.S.C. 102(e) as being anticipated by Honda U.S. Patent 6,406,942 B2.

Regarding claim 25, Honda discloses a method for fabricating a semiconductor circuit module, the method comprising; providing circuit devices 14, each having a contact area on a front side thereof (see column 9, lines 34-38); applying a patterned connection layer 2 to a transfer substrate 1 (see figure 3B); applying the front sides of the circuit devices to the patterned connection layer 2 (see figure 3R); applying a filler 16 between the circuit devices 14 (see figure 3S); removing the transfer substrate 1 (see figure 3N); and applying an electrical connection device 11 to connect the circuit devices 14 (see figure 3O).

Regarding claim 26, Honda discloses applying a protection layer 10 at least partially covering the electrical connection device 11 (see figure 3O).

Regarding claim 27, Honda discloses providing a second electrical connection device 13 in a region not covered by the protection layer 10 (see figure 3Q).

Regarding claim 29, Honda discloses arranging said circuit devices 14 on said patterned connection layer 2, such that the contact areas of the circuit devices 14 are not located on said patterned connection layer 2 (see figure 3R).

Regarding claim 31, Honda discloses providing an encapsulation layer 18 on backsides of said circuit devices 14 (see figure 4).

Regarding claims 32, Honda discloses applying the filler comprising selecting a process from the group consisting of casting (e.g., transfer sealing technique) and printing (see column 9, lines 47-56).

12. Claims 25, 31 and 33 are rejected under 35 U.S.C. 102(e) as being anticipated by Kwon et al. U.S. Patent 6,607,938 B2.

Regarding claim 25, Kwon et al. discloses a method for fabricating a semiconductor circuit module comprising; providing circuit devices, each having a contact area 52 on a front side thereof (see figure 12); applying a patterned connection layer 47 to a transfer substrate 41; applying the front sides of the circuit devices to the patterned connection layers 47 (see figure 14); applying a filler 81 between the circuit devices (see figure 15); removing the transfer substrate 41 (see figure 26); and applying an electrical connection device (59a, 59b 59c, or 90) to connect the circuit devices (see figure 27).

Regarding claim 31, Kwon et al. discloses providing an encapsulation layer 82 on backsides of said circuit devices (see figure 21).

Regarding claim 33, Kwon et al. discloses applying the encapsulation layer 82 comprising selecting a process from the group consisting of casting and printing (see column 6, lines 27-35; column 7, lines 19-22).

***Claim Rejections - 35 USC § 103***

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

15. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

16. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kwon et al. U.S. Patent 6,235,552 B1 in view of Lake et al. U.S. Patent 5,937,512 A.



Kwon et al. is applied as above but lacks anticipation on applying the patterned connection layer using a printing method. Lake et al. discloses applying a patterned connection layer using a printing method (see column 3, lines 2-33); in view of this disclosure, it would have been obvious to a person having ordinary skills in the art at the time the invention was made to apply the patterned connection layer by printing as disclosed in Lake et al. in the primary reference of Kwon et al. since photoresist layer 118 would not be required by using a printing process and processing costs would be reduced.

17. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable Kwon et al. U.S. Patent 6,607,938 B2 in view of Lake et al. U.S. Patent 5,937,512 A.

Kwon et al. is applied as above but lacks anticipation on applying the patterned connection layer using a printing method. Lake et al. discloses applying a patterned connection layer using a printing method (see column 3, lines 2-33); in view of this disclosure, it would have been obvious to a person having ordinary skills in the art at the time the invention was made to apply the patterned connection layer by printing as disclosed in Lake et al. in the primary reference of Kwon et al. in order to reduce processing costs.

18. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable Honda U.S. Patent 6,406,942 B2 in view of Lake et al. U.S. Patent 5,937,512 A.

Honda is applied as above but lacks anticipation on applying the patterned connection layer using a printing method. Lake et al. discloses applying a patterned connection layer using a printing method (see column 3, lines 2-33); in view of this disclosure, it would have been obvious to a person having ordinary skills in the art at the time the invention was made to apply the patterned connection layer by printing as disclosed in Lake et al. in the primary reference of Honda. Since a photoresist layer would not be required to deposit the patterned connection layer and processing costs would be reduced.

19. Claim 35 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kwon et al. U.S. Patent 6,607,938 B2 (hereinafter Kwon 938) in view of Kwon et al. U.S. Patent 6,235,552 B1 (hereinafter Kwon 552).

Kwon 938 is applied as above but lacks anticipation on disclosing that the encapsulation layer is cure before removing the transfer substrate. Kwon 552 discloses curing an encapsulating layer before a transfer substrate is removed (see column 5, lines 40-45); in view of this disclosure, it would have been obvious to a person having ordinary skills in the art at the time the invention was made to cure the encapsulation layer as disclosed in Kwon 552 in the primary reference of Kwon 938 in order to provide a desire structural stability to the encapsulation layer.

***Allowable Subject Matter***

20. Claim 30 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

21. The following is a statement of reasons for the indication of allowable subject matter: The prior art of record either singularly or in combination failed to anticipate or render obvious the limitations of curing the patterned connection layers after applying the circuit devices as required by claim 30.

***Conclusion***

22. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Shingai et al. and Hedler et al. disclose methods of fabricating semiconductor circuit modules using transfer substrates.

23. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Angel Roman whose telephone number is (571) 272-1681. The examiner can normally be reached on Monday-Friday 8:00am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Lebentritt can be reached on (571) 272-1873. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2812

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AR  
February 16, 2005



MICHAEL S. LEBENTRITT  
PRIMARY EXAMINER